CLAIMS

1. A method of forming a coating on a plastics substrate, the method comprising the steps of applying a metallic layer to the substrate and forming the coating from the metallic layer by subjecting the metallic layer to electrolytic plasma oxidation.

2. A method according to Claim 1, wherein the metallic layer is formed from one of aluminium, magnesium, titanium, tantalum, zirconium, neobydium, hafnium, tin, tungsten, molybdenum, vanadium, antimony, bismuth, and alloys of the aforementioned metals.

3. A method according to Claim 1 or Claim 2, wherein the metallic layer is deposited on the substrate.

4. A method according to Claim 3, wherein the metallic layer is sprayed on the substrate.

5. A method according to Claim 1 or Claim 2, wherein the metallic layer is adhered to the substrate.

6. A method according to any preceding claim, wherein the thickness of the metallic layer applied to the substrate is less than 100μm.

7. A method according to any preceding claim, wherein the substrate is roughened prior to the application of the metallic layer thereto.

8. A method according to any of Claims 1 to 6, wherein the metallic layer is formed on a second metallic layer previously applied to the substrate.

9. A method according to any of Claims 1 to 6, wherein the metallic layer is formed on a second polymeric layer previously applied to the substrate.

10. A method according to any preceding claim, wherein the substrate is an epoxy-carbon fibre composite or fibre reinforced plastics material.

11. A method according to any preceding claim, wherein the metallic layer is smoothened prior to the formation of the coating therefrom.

12. A method according to any preceding claim, wherein the electrolytic plasma oxidation is performed at a pH in the range from 7 to 8.5.

13. A method according to any preceding claim, wherein the thickness of the coating formed from the metallic layer is less than 100µm.

14. A method according to Claim 13, wherein the thickness of the coating formed from the metallic layer is less than 50µm.

15. A method according to any preceding claim, wherein the external surface of the coating formed from the metallic layer is subsequently treated to modify the physical and/or chemical properties of the coating formed on the substrate.

16. A method according to Claim 15, wherein an external layer of the coating is at least partially removed following formation thereof from the metallic layer.

17. A method according to Claim 16, wherein at least part of the external layer is abrasively removed from the coating.

18. A method according to any of Claims 15 to 17, comprising applying to the coating a material for reducing the porosity of the coating.

19. A method according to any of Claims 15 to 17, comprising applying to the coating a material for enhancing the corrosion resistance of the coating.

20. A method according to any of Claims 15 to 19, comprising applying to the coating a layer formed from one of a fluorocarbon, polytetrafluoroethylene, MoS_2, Carbon, Ni, Cr, Mo, W, carbides of any of the aforementioned metals, a paint and a resin.

21. A method of forming a coating on a metallic or plastics substrate, the method comprising the steps of applying a first metallic layer to the substrate, applying a second metallic layer over the first metallic layer, and forming the coating from the second metallic layer by subjecting the second metallic layer to electrolytic plasma oxidation.

22. A method according to any preceding claim, wherein the substrate is a component of a vacuum pump.

23. A vacuum pump component formed from metallic or plastics material and having a coating thereon formed by electrolytic plasma oxidation of a metallic layer applied to the component.